DOCUMENT RESUME

ED 033 506 EC 004 609

| | |
|---|---|
| AUTHOR | Seitz, Sue; Sweeney, Janee |
| TITLE | The Effects of Inter-Trial Manipulations on PA Learning in Retardates; An Investigation of Factors Influencing Learning in the Mentally Retarded, and Their Use in the Design of Instructional Materials. Interim Report. |
| INSTITUTION | Austin State School, Tex. |
| Spons Agency | Office of Education (DHEW), Washington, D.C. Bureau of Research. |
| Bureau No | BR-7-0185 |
| Pub Date | Aug 69 |
| Grant | OEG-0-8-070185-1750 |
| Note | 15p. |
| EDRS Price | EDRS Price MF-$0.25 HC-$0.85 |
| Descriptors | Educable Mentally Handicapped, *Exceptional Child Research, Intermode Differences, *Interval Pacing, Learning Processes, *Mentally Handicapped, *Paired Associate Learning, Performance Factors |

Abstract

The effects of interspersed trials on prompted (P) and confirmation (C) paired associate learning were studied in 64 institutionalized educable mental retardates. Subjects were instructed to learn eight pairs of pictures which were presented by a slide projector. There were four groups in both the P and C condition. The treatment for these groups consisted of practice trials followed by two blocks of neutral trials, or two blocks of test trials, or one block of test trials, or no intervening material. Inclusion of interspersed test trials significantly improved performance in the C condition (p less than .05). This supports Izawa's (1968) findings that interspersed nonreinforced test trials significantly improved performance in the C condition. The results suggest that subtle variations in the methods of task presentation might be producing some of the discrepancies reported in studies on P and C learning. (Author)

ED033506

PA-40
BR 7-0185
OE/BEH

INTERIM REPORT
Project No. 7-0185
Grant No. OEG 0-8-070185-1750

# An Investigation of Factors Influencing Learning in the Mentally Retarded, and Their Use in the Design of Instructional Materials

August 1969

EC004609

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
Bureau of Research

INTERIM REPORT
Project No. 7-0185
Grant No. OEG 0-8-070185-1750

# An Investigation of Factors Influencing Learning in the Mentally Retarded, and Their Use in the Design of Instructional Materials

## The Effects of Inter-Trial Manipulations on PA Learning in Retardates

Sue Seitz and Janee Sweeney

Austin State School

Austin, Texas

August 1969

The research reported herein was performed pursuant to a grant with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
Bureau of Research

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

# The Effects of Inter-Trial Manipulations on PA Learning in Retardates

Sue Seitz and Janee Sweeney
Austin State School

## Abstract

The effects of interspersed trials on prompted (P) and confirmation (C) PA learning were examined. Ss were 64 educable mental retardates institutionalized at the Austin State School. They were instructed to learn 8 pairs of pictures which were presented by a slide projector. There were 4 groups in both the P and the C condition. The treatments for these groups consisted of practice trials followed by 2 blocks of neutral trials; or, 2 blocks of test trials; or, 1 block of test trials; or, no intervening material. Inclusion of interspersed test trials significantly improved performance in the C condition. ($p<.05$). This supports Izawa's (1968) findings that interspersed non-reinforced test trials significantly improved performance in the C condition. The results suggest that subtle variations in the methods of task presentation might be producing some of the discrepancies reported in studies on P and C learning.

The Effects of Inter-Trial Manipulations on PA Learning in Retardates

Sue Seitz and Janee Sweeney
Austin State School

Contents

I. Introduction

II. Method

III. Results

IV. Discussion

V. References

VI. Tables

Table 1 - Means and Sds of the CA, IQ, and MA for the Eight Groups of Ss. Duncan's Multiple Range Test Showed No Differences Between the Groups on any of These Measures.

Table 2 - Training Schedule for the Eight Groups of Ss: R = Eight Reinforced Practice Trials; T= Eight Non-Reinforced Test Trials; N= Eight Slides of Neutral Stimuli.

Table 3 - Summary of Analysis of Variance for Total Error Scores

Table 4 - Summary of Analysis of Variance for Total Error Scores in C Condition

Table 5 - Means and SD on the Error Scores for the Four C Groups

Table 6 - Summary of Analysis of Variance for Total Error Scores in the P Condition

# The Effects of Inter-Trial Manipulations on PA Learning in Retardates

Sue Seitz and Janee Sweeney
Austin State School

## Introduction

Prompted (P) or guided learning, and confirmation (C) or trial-and-error learning have been reported to differentially affect performance according to whether the task is discrimination or PA learning. Cook and his associates (Cook, 1958; Cook and Kendler, 1956; Cook and Spitzer, 1960) found that P was generally more effective than C in PA learning. But, these findings were not supported by other researchers (Hawker, 1964a; 1964b; 1964c; 1965s; 1965b; 1966a; Lockhead, 1962; Silberman, Merlaragno and Coulson, 1961). Furthermore Hawker (1966) reports that P facilitates discrimination learning in mentally retarded children. These discrepancies suggest that variables other than the type of task may be operating.

One such variable affecting C performance has been shown to be interspersed test trials (Seitz, 1969; Izawa, 1968). Seitz found that in the C condition, elimination of interspersed test trials significantly improved performance of a discrimination task by mentally retarded Ss. Izawa (1968) found that the inclusion of interspersed trials improved the performance of normal Ss in a PA task.

Therefore this study was designed to determine the effect of interspersed trials in PA learning by mentally retarded Ss. Although Izawa utilized a C learning paradigm, and this research parallels her design, it was extended in order to investigate the effects of interspersed trials on PA learning under P as well as C conditions.

## Method

Subjects. 64 institutionalized retardates served as Ss. All Ss were sophisticated in PA learning tasks. Eight Ss were randomly assigned to each of the eight experimental groups. Duncan's multiple range tests indicated no significant differences among group means for MA, CA, or IQ. (See Table 1) (The principal instrument for assessing IQ is the WISC.)

---

Insert Table 1 about here

---

Apparatus. Stimulus figures (SF) and response figures (RF) were presented visually using a Carousel slide projector. Each of the eight slides consisted of five figures: the SF at the top of the frame, centered, and four RFs across the bottom. There were 8 RFs over-all, each of which served as the correct RF on one of the eight trials. The correct RF was always randomly positioned. The SFs were eight pictures of different animals and the correct RF and the three response alternatives were selected from eight pictures of different foods. The format of the slide used for the neutral trials consisted of eight different single geometric figures.

Procedure. After an initial familiarization block of eight reinforced practice trials and a block of test trials, both P and C conditions were treated to the schedule presented in Table 2.

---

Insert Table 2 about here

---

In this table R represents a block of eight reinforced practice trials; T represents a block of eight non-reinforced test trials; and N represents a block of eight neutral stimuli.

In the P condition the R slides were the eight frames, previously described, shown separately with the correct RF underlined. The S was asked to verbalize the correct RF. The E then said "That's right" and changed the slide. The slides for the non-reinforced test trials were the same eight frames as the slides for reinforced trials except that the line which indicated the correct RF was omitted. In the C condition, the R and the T slides differed only in the method of presentation. During the R trials, the unmarked slide was changed only after the S indicated the correct RF. In addition, the E said "That's right." During the T trials, in both the P and C conditions, the slide was changed after the S chose what he thought was the correct RF even if it was not correct. Also in both conditions, the S was instructed to merely look at the neutral slides.

Izawa's (1968) design was modified to facilitate these mentally retarded Ss' ability to master the task, in that the final test trials required recognition of the correct RF instead of recall. Also, a maximum of two blocks of T and N slides were shown instead of four, as Izawa used in her study. This modification resulted from a study in which it was found that Ss would refuse to do the task

when four blocks of T or N trials were used.

## Results

A comparison of the over-all mean error scores for the P condition (Mean=1.34) and the C condition (Mean=1.91) indicated that there was no significant difference due to these treatment variables (t=1.78; df=62). However, an analysis of variance or errors of groups in the C and P conditions which produced the worst and the best performances indicated that a significant difference existed among these four groups: (Group 3, 4, 5 and 7, F=5.79, 3/28 df; p<.01), See Table 3.

---

Insert Table 3 about here

---

An orthogonal comparison showed that most of the variance was accounted for by the difference between Group 4 (Mean=.75) which was the group with the best performance in the P condition and Group 5 (Mean=3.63) which was the group having the worst performance in the C condition. (F=14.7, 1/28 df, p<.01).

An analysis of variance of errors in the C condition alone indicated a significant difference among these four groups. (F=3.72, 3/28 df, p .05). An orthogonal comparison between Groups 5 (M=3.63) and 7 (Mean=1.13) showed that most of the variance was accounted for by the difference between these two groups. See Table 4.

---

Insert Table 4 about here

---

The Means and SDs for the error scores of these four groups are shown in Table 5.

---

Insert Table 5 about her

---

An analysis of errors in the P condition alone indicated no significant difference among the four groups. (F<1.), See Table 6.

---

Insert Table 6 about here

---

## Discussion

The fact that there was no over-all difference between performance under P and C conditions supported Hawker's (1965b) finding, but not Cook's (1958) results in regard to PA learning. However, when the significant difference between the RNN group in the P condition and the R group in the C condition is taken into account, it suggests that the discrepancy between Hawker and Cook's results might have been due to different internal mechanisms of task presentation. The pattern of error scores in the four C groups followed those seen in Izawa's study: R RNN RT RTT. However, the only significant difference was between the R and the RTT groups. The results did not show the significant difference between the RNN and the R groups which Izawa found. This might have been due to the reduction in the number of interspersed N trials. However, interspersed trials in the P condition did not produce a similar pattern of results. Furthermore Seitz found that interspersed trials disrupted discrimination learning, therefore, Izawa's statement that "unreinforced test trials prevent forgetting and at the same time facilitate over-all acquisition" should be limited to PA trial-and-error learning.

## References


Cook, J. O. Supplementary report: processes underlying learning a single paired-associate item. Journal of Experimental Psychology. 1958, 5, 455.

Cook, J. O. & Kendler, T. S. A theoretical model to explain some paired-associate learning data. In G. Finch & Cameron (Editions), Symposium on Air Force human engineering, personnel, and training research. Washington: National Academy of Science, National Research Council Published 455, 1956, pp. 90-98.

Cook, J. O. & Spitzer, M. E. Supplementary report: prompting vs. confirmation in paired-associate learning. Journal of Experimental Psychology, 1960, 59, in press.

Hawker, J. R. The effects of prompting and confirmation in a serial learning task. Journal of Experimental Psychology, 1964, 67, 99-101. (a)

Hawker, J. R. The influence of training procedure and other task variables in p-a learning. Journal of Verbal Learning and Learning Verbal Behavior, 1964, 3, 70-76. (b)

Hawker, J. R. Training procedure and practice-test ratio in the acquition and retention of a serial maze pattern. Psychonomic Science, 1964, 1, 97-98. (c)

Hawker, J. R. The effects of training procedure, response availability, and response meaningfulness in multiple-choice paired-associate learning. Psychonomic Science, 1965, 3, 329-330. (a)

Hawker, J. R. The effects of training procedure, response similarity, and number of response alternative in multiple-choice paired-associate learning. Psychonomic Science, 1965, 3, 331-332. (b)

Hawker, J. R. Training procedure and verbal-discrimination learning by mental retardates. Research Report No. 3, 1966, Austin State School, Behavioral Development Center, Austin, Texas.

Izawa, C. Effects of successive reinforcements, tests, and neutral trials in paired-associate learning. Reprinted from the Proceedings, 76th Annual Convention, APA, 1968.

Lockhead, G. R. Methods of presenting paired-associates. Journal of Verbal Learning and Verbal Behavior, 1962, 1, 62-65.

Seitz, S. The effects of variations in confirmation training on discrimination performance. Psychonomic Science, 1969, 14, 145-147.

Silberman, H. F. Melaragno, R. J. and Coulson, J. E. Confirmation and prompting with connected discourse material. Psychological Reports, 1961, 9, 235-238.

Table 1

Means and SDs of the CA, IQ, and MA for the Eight Groups of Ss. Duncan's Multiple Range Test Showed No Differences Between the Groups on any of These Measures.

| Condition | Group | | MA | CA | IQ |
|---|---|---|---|---|---|
| P | 1 | Mean | 8.99 | 14.53 | 62.13 |
| | | SD | 1.68 | 2.54 | 8.54 |
| | 2 | Mean | 8.94 | 14.81 | 61.63 |
| | | SD | .832 | 2.45 | 10.2 |
| | 3 | Mean | 9.69 | 15.94 | 61 |
| | | SD | 1.64 | 2.37 | 6.78 |
| | 4 | Mean | 9.41 | 14.8 | 63.75 |
| | | SD | 1.09 | 1.8 | 4.03 |
| C | 5 | Mean | 8.66 | 14.7 | 63.75 |
| | | SD | 2.27 | 3.17 | 7.94 |
| | 6 | Mean | 9.44 | 14.66 | 65.13 |
| | | SD | 1.39 | 2.07 | 10.75 |
| | 7 | Mean | 9.38 | 16.38 | 63.63 |
| | | SD | 2.47 | 1.05 | 10.75 |
| | 8 | Mean | 10.0 | 15.67 | 63.13 |
| | | SD | 2.65 | 2.54 | 8.71 |

Table 2

Training Schedule for the Eight Groups of Ss: R= Eight Reinforced Practice Trials; T= Eight Non-Reinforced Test Trials; N= Eight Slides of Neutral Stimuli.

| Condition | | Blocks of 8 Trials | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Test |
| P Group | 1 | R | R | R | R | R | R | R | R | T-recog |
| | 2 | RT | RT | RT | RT | RT | RT | RT | RT | T-recog |
| | 3 | RTT | RTT | RTT | RTT | RTT | RTT | RTT | RTT | T-recog |
| | 4 | RNN | RNN | RNN | RNN | RNN | RNN | RNN | RNN | T-recog |
| C Group | 5 | R | R | R | R | R | R | R | R | T-recog |
| | 6 | RT | RT | RT | RT | RT | RT | RT | RT | T-recog |
| | 7 | RTT | RTT | RTT | RTT | RTT | RTT | RTT | RTT | T-recog |
| | 8 | RNN | RNN | RNN | RNN | RNN | RNN | RNN | RNN | T-recog |

Table 3

Summary of Analysis of Variance for Total Error Scores

| Source | ss | df | MS | F |
|---|---|---|---|---|
| Bss | 39.10 | 31 | 13.03 | 5.79* |
| Group 4 vs 5 | 33.07 | 1 | 33.07 | 14.70* |
| Within | 63.12 | 28 | 2.25 | |
| Total | 102.22 | 31 | | |

*p<.05

Table 4

Summary of Analysis of Variance for Total Error Scores in C Condition

| Source | ss | df | MS | F |
|---|---|---|---|---|
| Bss | 32.10 | 3 | 10.70 | 3.72* |
| Group 5 vs 7 | 25.01 | 1 | 25.01 | 8.68* |
| Wss | 80.62 | 28 | 2.88 | |
| Total | 122.72 | 31 | | |

*p<.05

Table 5

Means and SD on the Error Scores for the Four C Groups

| Condition | Group | Mean | SD |
|---|---|---|---|
| C | 5 | 3.63 | 1.30 |
| | 6 | 1.38 | 2.07 |
| | 7 | 1.13 | 2.04 |
| | 8 | 1.50 | 1.69 |

Table 6

Summary of Analysis of Variance for Total Error Scores in the P Condition

| Source | ss | df | MS | F |
|---|---|---|---|---|
| Bss | 5.35 | 3 | 1.78 | .58 |
| Wss | 85.87 | 28 | 3.07 | |
| Total | 91.22 | 31 | 2.95 | |